galvanic currents by streaming of liquids through tubes, Herr Dorn infers that the motion of the liquid in itself produces no considerable part of the electromotive force observed; the influence of the tube wall, on the other hand, is undoubted.—Herr Wiedemann shows that an examination of magnetic behaviour of iron oxide salts is well adapted for determining with accuracy, even quantitatively, their dissociation in solutions at different temperatures, the conditions of their fixation by acids, and their exchange with other salts.—In the first portion of an inquiry into the divergences of some gases from Boyle's law at 0° and 100°, Herr Winkelmann gives an interpolation formula, expressing this divergence in the case of ethylene.—A new proposition in the theory of diffraction proved by Herr Frölich, is, that with small angles of diffraction, the kinetic energy of the incident light for an aperture of any shape is equal to the kinetic energy of the diffracted light.—Some experiments on the nature of the phases and change composition in telephonic transmission are described by Herr Hermann.—There are also notes on the relation between refraction equivalent and wave length, and on excitation of electricity by pressure and friction.

Journal of the Franklin Institute, October.—This contains a short account by Prof. Henry Draper, of his eclipse observations at Rawlins, Wyoming Territory, together with a photograph of the corona, showing the unequal distribution of its matter in the plane of the ecliptic and ray-like forms towards the poles of the sun.—Mr. Bell furnishes an account of the now historic "Camel" locomotive engine of Ross Winans, built in June, 1848. It first practically demonstrated the superiority of the eight-wheel connected engine for heavy traffic; it had also an inclined firebox, and other features of novelty.—The new system of electric lighting by Profs. Thomson and Houston, is described, consisting in causing one or both the carbon electrodes to vibrate to and from each other, so that the effect of the light produced is continuous. This allows of a feebler current being used.—Mr. Isherwood analyses some Scotch experiments on economic vaporisation of water and expansion of steam.

SOCIETIES AND ACADEMIES

LONDON

Linnean Society, November 7.—Prof. Allman, F.R.S., president, in the chair.—Sir Joseph D. Hooker, C.B., presented to the Society, in the name of a committee of gentlemen, a portrait of the Rev. M. J. Berkeley. A great matted mass in sheet of a Chara (*Nitella* sp. ?) was exhibited by Dr. Thos. Boycott. It had been got from a dried-up pond in St. Leonard's Forest, Sussex, June, 1877; within its meshes many interesting microscopic forms were obtained.—Mr. Thos. Christy next called attention to living specimens of West African indian-rubber trees, the *Urostigma Vogelii*, and another undetermined species recently arrived. He likewise showed the fruit, flower, and leaf in spirit, with a dried ball of the gum of the commercially valuable *Landolphia florida*.—Dr. Maxwell Masters read an extract from a letter of Dr. Beccari describing a gigantic Aroid found by him in Sumatra, side by side with the *Rafflesia arnolii*. The species has a large tuber 5 feet round, from which is pushed up a single leaf, with a long, stout petiole, the divided blade covering an area of 45 feet, or 15 metres.—Dr. R. C. A. Prior showed a specimen of *Colletia cruciata* in blossom, grown out of doors in Somersetshire by the Rev. W. Sotheby.—"Notes on Euphorbiaceæ," by Mr. G. Bentham, read in title, was a paper treating of the history, nomenclature, systematic arrangement, and the origin and geographical distribution of this remarkable order of plants. Among Dicotyledons, Euphorbiaceæ stands fourth in point of numbers, having above 3000 species and 200 genera. In investigating the origin of the order the geological record, unfortunately, is of no assistance. Their evident, generally tropical nature, is a striking feature, and, judging from various data, it is conjectured that their most ancient home was in the old world. Their affinities have repeatedly been discussed by botanists, but though there are individual genera which may exhibit some one character supposed to ally to other orders, yet no real connection has hitherto been pointed out. Their isolation is produced, not so much by any one special character, as by a special combination of several. As to position in the linear series, unless the order be broken up, practically it must remain among the Monochlamydeæ, in spite of occasional presence of corolla in some forms. The author has a most interesting chapter on nomenclature and synonymy, well worthy the study and serious attention of biologists generally.—Mr. Lewis A. Bernays, in a letter to the secretary, records the undoubted existence of *Carpesium cernuum*, in Queensland, and suggests its being indigenous there.—In a paper given in abstract, "Descriptions of New Hemiptera," by Dr. F. Buchanan White, the diagnosis of 2 new genera (*Helenus* and *Neovelia*) and 17 new species are entered. These mainly are the results of Prof. Trail's late exploration of the regions bordering the River Amazon.—Mr. Alfred W. Bennett read a communication, "Notes on Cleistogamic Flowers; chiefly of *Viola*, *Oxalis*, and *Impatiens*." According to him there are two kinds:—(1) Those which hardly differ from the perfect open flowers, other than the partial or entire suppression of the corolla, and the closing of the calyx (= homocleistogamic); and (2) those with a distinct modification in the flower to aid self-fertilization (= heterocleistogamic). He was at first disposed to regard those two kinds as having arisen, one by degradation, the other by a rudimentary form of the organ: but subsequent examination convinced him that both kinds owe their origin to degradation. In the extreme cleistogamic flowers a large number of organs have been correlatively modified. Most interesting phenomena occur in the mode of emission of the pollen tubes, these travelling through the air in a straight line from the anther vertically upwards in *Oxalis*, horizontally in others, and creep along the surface and even back of ovary in *Viola canina*. An unseen agency directs, for none wander with uncertainty; and this is all the more remarkable because, when not in proximity to the stigma, the pollen grains protrude their tubes in all possible directions.—The Rev. G. Henslow orally delivered the gist of a paper "On the Absorption of Dew and Rain by the Green Parts of Plants" (*vide Science Notes*).—The Rev. W. W. Fowler and Messrs. Wilfred Huddlestone and T. M. Shuttleworth were elected Fellows of the Society.

Chemical Society, November 7.—Dr. Gladstone, president, in the chair.—The following papers were read:—Contributions from the Laboratory of Tôkio, Japan. On the red colouring matter of the *Lithospermum erythrorhizon*, by M. Kuhara. The purple colouring matter was prepared from the root by extracting with alcohol, purifying by treatment with lead acetate, &c.; it forms a dark, resinous, uncrystallizable mass, with a metallic green reflection, soluble in alcohol, ether, benzol, almost insoluble in water; it resembles in some respects anchurin, the colouring matter from alkanet. A bromine and a chlorine compound were prepared.—A second report on some points in chemical dynamics, by C. R. A. Wright, and A. P. Luff. The authors have continued their previous research and have determined the temperature of initial action of carbonic oxide, hydrogen, and carbon on various oxides of iron, manganese, lead, cobalt, and nickel. They find that the general law holds good, that the temperature of the action of carbonic oxide lies below that of hydrogen, which again is below that of carbon; this rule appears to be a special case governed by the general law that *cæteris paribus* the greater algebraically is the heat evolution taking place during a reducing action on a metallic oxide, the lower is the temperature at which the action is first noticeable during a few minutes' action.—Note on the constitution of the olefine produced by the action of zinc upon ethylic iodide, by Dr. Frankland and Mr. Dobbin. The gas given off was passed through a cohol and sulphuric acid, and then absorbed by antimonic chloride; on heating with water and distilling a chloride was obtained, boiling at 83° C.; it was therefore ethylenic, and not ethylidenic chloride.—On the occurrence of certain nitrogen acids amongst the products of the combustion of coal gas and hydrogen flames, by L. T. Wright. The author proves that the origin of the nitrogen acids found in the condensed water procured by burning coal gas or hydrogen in the air is ammonia, either free or combined, no such acids being produced when the gases are carefully freed from ammonia.—On the action of bromine upon sulphur, by J. B. Hannay.—Researches on dyeing. Part I. Silk and rosanilin, by Dr. Mills and Mr. G. Thomson. The authors have investigated the nature of the transaction which occurs when a vat is exhausted of its tinctorial ingredients. The experiments consisted in immersing a constant area of white silk in a solution of a rosanilin salt at a constant temperature for varying times, and then determining the loss of strength of the rosanilin solution.—Comparison of the actions of hypochlorites and hypobromites on some nitrogen compounds, by H. J. H. Fenton. The compounds selected were, ammonium carbamate, guanidine, and biuret.—Notes on two new vegeto-alkaloids by

F. von Müller and L. Rummel. The authors have prepared alstonin from the bark of alstonia constricta, and duboisin from the leaves and twigs of duboisia myoporoides; the latter closely resembles piturin.—On the determination of lithia by phosphate of soda, by C. Rammelsberg. The author confirms his previous results as to the formation of a double salt of sodium and lithium phosphate and the consequent inaccuracy in lithia determinations made by Mayer's method; he also gives some analyses of lithia micas.

Physical Society, November 9.—Prof. G. C. Foster, vice-president, and afterwards Prof. W. G. Adams, president, in the chair.—The following candidate was elected a Member of the Society:—Sir Frederick Elliot.—Prof. W. G. Adams explained a simple appliance made by Mr. S. C. Tisley for exhibiting the coloured bands due to interference with thick plates. The bands due to regular reflection and refraction were produced by two thick plates nearly parallel to each other and fixed in a brass box with rectangular apertures on its flat faces so that the light fell on the first plate at an angle of 60°, the whole apparatus being of a convenient size for the waistcoat pocket. On a previous occasion (June 23, 1877), Prof. Adams exhibited these bands to the Society, but not in a portable form. The elliptical interference bands, due to the scattering or diffusion of light at a point on the front surface of one of the plates, were shown by means of a precisely analogous arrangement, except that the inclination of the plates to each other was somewhat greater; in this case the interference bands, formed by *regular* reflection and refraction, fall in another direction, so that they are not received by the eye; the diffusion interference fringes obtained were clearly visible when thrown on the screen. They are formed by rays once diffused from points on the first surface and afterwards regularly reflected and refracted from the front and back faces of the two plates in succession. Prof. Adams pointed out that this instrument would form a convenient means of obtaining polarized light in cases where the length of a Nicol's prism is objectionable, for instance, under the stage of a microscope; the light will be completely polarized if the plates be placed to receive the light at the polarizing angle, and the field will be much brighter than when a plate of tourmaline is employed.—Prof. W. F. Barrett exhibited and explained Edison's microtasimeter and carbon telephone. These have been recently described in NATURE. In the course of a brief recapitulation of the history of these instruments, he referred to Du Moncel's early observations, published in 1856, that variations in the resistance of a circuit can be produced by varying the pressure on metallic surfaces in contact, and after referring to Clérac's plumbago rheostats he stated that Edison was probably the first to apply the diminished resistance of carbon under pressure to a practical use, which he did early in 1877 in his carbon relay, the progenitor of the carbon rheostat, micro-tasimeter and carbon telephone. In all he uses compressed lampblack, a button of which may be formed as follows. The wick of a paraffin lamp having been cut so that it smokes, a quantity of lampblack is formed in the chimney; the lower portion, which has the more intense black colour, is collected from time to time, and all brown particles must be carefully removed, since they offer a greater resistance. The mass is compressed into a disc about the size of a sixpence, crushed, passed through a fine sieve, and again compressed, and this operation may be two or three times repeated in order to attain to perfect uniformity. The original form of tasimeter, in which the hard rubber or other substance was placed horizontally, has been modified so that the whole is vertical. The carbon button rests on a smooth metallic surface in connection with a binding screw, and a similar conducting surface rests upon it leading to a second binding screw. A strip of hard rubber 1 inch long, $\frac{1}{4}$ inch wide, and $\frac{1}{16}$ inch thick, is supported vertically above it, its upper end being attached to a fine screw worked by a tangent screw with graduated head. The whole is inclosed in a heavy conical brass box. Prof. Barrett suggested that it would be preferable to make this jacket cylindrical, and that the whole should be inverted, because the weight of the strip on the button is found to prevent the needle of the galvanometer returning at once to zero. Employing one Daniell's cell and inserting a shunt, Wheatstone's bridge, and resistance coils in the circuit, it was shown that the hand, at some distance, caused a considerable deflection, and Prof. Barrett stated that in a still room the instrument becomes so sensitive as to be almost unmanageable. By replacing the hard rubber by a strip of gelatine varnished on one side, a very slight change in the hygrometric state of the atmosphere can be detected by the absorption of moisture causing expansion of the gelatine, and, therefore, compression of the carbon. Its action as an aneroid baroscope was suggested by Prof. Barrett, the button being associated with an exhausted box. He pointed out that before the tasimeter can be used as a measuring instrument, experiments must be made in order to ascertain the exact relation between the resistance of carbon and the pressure to which it is subjected. The carbon telephone, full particulars of which will be found in NATURE, vol. xix. p. 12, was next described, and Mr. Adams, Mr. Edison's assistant, now in England, exhibited a complete transmitting apparatus, with call, &c. A very ingenious and simple form of shunt, received from Mr. Edison with the tasimeter, deserves mention. A row of brass studs fixed on a board are united by plugs, so that if the current enters at one end it can pass out at the other without meeting with any appreciable resistance. But if a plug be removed it throws in about 4 inches of a resisting wire wound over two rows of pins, underneath the board, one row of which is in metallic connection with the studs; thus the entire length of wire is in circuit when all the plugs are removed. Finally, Prof. Barrett mentioned that a communication has just been received from Mr. Edison stating that he has succeeded in arranging an efficient receiving instrument in which no form of magnet is employed.—Mr. Ladd then showed several forms of electric lamp arranged so as to render the use of clockwork unnecessary. In that known as Wallace's workshop lamp the spark passes between the edges of two plates, the lower one being fixed while the upper one is raised to a suitable distance by an electro-magnet brought into action immediately on the passing of the current. A second form, in which an annular magnet was employed, acted on the same principle, the armature carrying the upper plate being specially arranged so as to give a maximum of attractive force. In the third form, the V-lamp, two rods of graphite were inclined at an angle of 45° to the vertical, resting in contact on a piece of china. Immediately on the current passing an electro-magnet is caused to act, and, after the rods have been firmly gripped, they are separated and the support removed. Should the circuit be broken they will at once fall together.

VIENNA

Imperial Academy of Sciences, October 10.—The deaths of Dr. Rokitansky and Prof. Tomaschek were referred to.—The following among other papers were read:—The dolomite ridges of South Tyrol and Venetia (Heft 2 and 3), by Dr. Mojsisovics.—On electric penetration of glass, by Prof. Mach.—On the relation of diffusion-phenomena to the second proposition of the mechanical theory of heat, by Prof. Boltzmann.—Calorimetric research on the heat of combination of carbonic acid gas and ammonia gas, to carbonate of ammonia, by Herr Lecher.—Action of radiant heat of the sun on a body in shade—time of occurrence of maximum temperature, by Herr Schlemüller.—Description of a telescope, by means of which, with one objective, you may point on two objects simultaneously, one distant, the other near, (sealed packet) by Herr Schneider.—Physical experiments, by Dr. Gross.—Distance reflector with precision-reading, by Herr Kuczera.—Discovery of a comet, by Mr. L. Swift.—Meteorite fall at Tieschitz in Mähren, July 15 last year, by Herr Tschermak.—Development-history of the prothallium of *Scolopendrium vulgare*, Sym., by Dr. Beck.

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